DOCUMENT RESUME

ED 137 162 SO 009 873

AUTHOR Wieting, Stephen G.
TITLE Simulated Research Experiences for Teaching Research Methodology: Some Educational Computing Implications.
PUB DATE 76
NOTE 29p.; Paper presented at Annual Meeting of the American Sociological Association (New York, New York, August 30-September 3, 1976)

EDRS PRICE MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS *Computer Assisted Instruction; Computers; Decision Making Skills; Educational Environment; Educational Games; Educational Research; Higher Education; Instructional Improvement; Learning Characteristics; Learning Experience; *Research Methodology; *Simulation; *Sociology; Student Attitudes; Tables (Data); Teacher Developed Materials; Teaching Methods; *Teaching Techniques

ABSTRACT

The ambiguities surrounding computer simulations in sociology teaching and research on the university level are described and the implications of computers as a teaching technique are explored. Intended as an explanation to sociology teachers and researchers of how students' learning experiences are shaped by their orientations to computer environments, departmental organization, and university organization, the paper is presented in three sections. Section I discusses the relationship between using the computer for educational purposes and sociological theory. Simulation examples and observations on educational environments are given. Section II presents reasons why computer usage is a particularly suitable topic for educational research. Reasons include the compatability of computer technology with both teaching and research and evidence that students improve decision-making skills when trained in computer simulations. There are also indications that participation in computer simulations contributes to development of basic sociological knowledge which, in turn, facilitates learning of sociological theory. Section III discusses computer usage by the reformist element in sociology within the framework of statements by sociologist Wilbert Moore. Tables, a questionnaire of student attitudes toward research methodology, and references dealing with sociology education, simulations, student evaluations, and computerized education are included. (Author/DB)

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SIMULATED RESEARCH EXPERIENCES FOR TEACHING RESEARCH METHODOLOGY: SOME EDUCATIONAL COMPUTING IMPLICATIONS *

Stephen G. Wieting

Department of Sociology

University of Iowa

SP009873

Prepared for presentation during the annual meetings of the American Sociological Association, New York, Fall, 1976.

Introduction

These comments represent a retrospect of four years of effort developing computer applications for undergraduates in sociology. The material primarily comes from experiences in the development and implementation of one specific package. SIMSEARCH is a package of six simulations devoted to decision making in research. The simulations are about research in the areas of generational conflict, family, sport, deviance, culture of poverty, and sex roles. They are used in an undergraduate methods course. The material, however, reflects more generally experiences as they have been shaped by students' overall orientations to computer environments, departmental organization, and university organization. My intention is thus two-fold: to provide further description of the simulations (other aspects of which were reported in Wieting, 1975), but also to explore the organizational implications of this line of work. At the outset of this educational computing project a premium was placed on the definition of computers and education being a social organizational issue instead of being a technical or individualistic concern. Therefore, any work done, it was felt, should reflect and add to the general understanding of the social organization of computing and education. This statement is, then, an attempt to be consistent with that priority. In the earlier paper mentioned, I spoke of the organizational aspects of the specific educational environment constructed; here I extend this to issues of interface with other facets of the educational institution. The points of interface examined are sociological theory and educational computing; teaching and research in a university setting; and the reformist element in educational computing.

I. Educational Computing and Sociological Theory

In 1972, a group of undergraduates taking a methods course and I spent a semester meeting periodically to discuss the incorporation of practical experiences into this required methods course. Three criteria for such an experience were cited:

(a) the capacity to understand and do research is a combination of knowledge and skill -- and hence practical exposure of some sort is required;

(b) the experience should provide immediate feedback on the consequences of research decisions made in the practical setting;

(c) the experience should allow students more easily to learn and advance in studies of research techniques at their own pace.

The alternative that was agreed on was a research simulation. This would simulate the principles of research practice, meet the committee requirements for the practical part of the course, and operate without the liabilities of actual research. After a period of development and testing, six computer simulations were produced.

In addition to this student specification of this experience, an effort was made to ground the development and implementation in some sociological theory of educational settings. Having been introduced to the work of O.K. Moore and A.R. Anderson (1969) and impressed by its comprehensiveness and quality, it was used. Central to the design facets articulated by Moore and Anderson is their assessment of social change in the past thirty years and the implications of the change for the quality of educational experiences to which individuals in contemporary society should have access. They contend that prior to WWII the nature of information in industrial societies was relatively static and finite; such a society they term a performance society. Since that period, in their view, an essentially

dynamic kind of information has developed, which they say has made today's society a learning society. The basic shift in quality requires that persons be educated in contemporary social settings in a different manner than through the procedures considered appropriate for the performance society. In order adequately to train persons for this quality of life it is incumbent on educators to structure learning contexts possessing the logical and empirical outcomes required by society.

The structures they propose are based on four educational principles. The first, the perspectives principle, seeks to provide a range of perspectives or roles for the learner. That is, rather than be a passive receptor of sociological knowledge (the patient perspective or role), the setting should also provide training in the perspectives of agent, strategist, and referee. The second, the autotelic principle, refers to the sanction system of the learning environment. In order actually to effect the quality and extent of problem-solving practice and creative decision-making desired, the environment must be as free as possible from threats and sanctions which are based on factors extraneous to the activity of the students. The productivity principle (the third) refers to the learning facet that an optimal context predisposes toward problem-solving and cognitive growth when elements of information wholes are presented to students but not completed for them. The fourth, the personalization principle, refers to Moore and Anderson's view that the environment will provide freedom for exploration, rapid feedback, and the opportunity for self-pacing.[1]

In order to concretize these principles, an experience was provided for students that involved progressing through the decision making that occurs in the six steps of research: formation of a problem; theory; sampling; design of proof; measurement; and analysis. General properties of the

simulations have been described in another context; here a more detailed picture will be provided by presenting some of the substantive material that comprises the simulations and is exchanged in the interactive setting involving the student and the computer through a remote terminal access. At each decision point (e.g., problem, theory, etc.), a range of alternatives is provided. If the student selects the correct option he or she receives feedback on the reason for the appropriateness of the choice. Then the computer proceeds to the next decision point and provides the array of alternatives to the student. If an incorrect alternative is selected, the student is given an explanation of the weakness of the alternative and another selection is made. The student in the simulation is asked to assume that unless otherwise specified he or she will have one year to complete the research and $1000.00 in financial resources for the research.

The autotelic principle is described by Moore and Anderson in this way (1969:587): For an environment to be autotelic it must protect its denizens against serious consequences so that the goings on within it can be enjoyed for their own sake." This was translated to mean that some real event (which could be serious in its consequences) is conveyed to the student in a factually non-threatening situation but where the prospect of dealing with the event is an inherently interesting one. One example might be this exchange from the simulation on the culture of poverty (POVCUL) where the "researcher" is posed the possibility of influences from certain groups in the research site and this situation must be resolved. Here the "researcher" is undertaking an extended period of ethnographic field study in a depressed urban area.

Material Presented to Student

V. UNEXPECTED OCCURRENCE

After you have lived in the urban area for two months, you are contacted by a local group of older residents. They have heard of your study. They will be willing to assist you and help you gain access to needed information. However in return they want you to find out the level of drug use and crime among the younger segments of the culture. What would you do?

1. Leave the area and stop the research.
2. Agree to assist them as you need the information they promise.
3. Use this chance to solidify trust among the young segments by telling of the influence attempt.
4. Ignore this influence.

Range of Response to the Student, Contingent on Selecting Any of the Four Possible Alternatives (Here, "4" is considered the most appropriate.)

Response to "1"

The information does not suggest so extreme a reaction is called for. You are not endangered necessarily. To leave may undermine the credibility of your research generally. And you would have lost two months investment of time and money.

Response to "2"

This may give you access to some information. However, you may lose the trust of other segments of the area. Also, you lose control over the conditions and write-up of your research. These last factors would almost in every case outweigh the gains of assisting the interest group.

Response to "3"

Even though you may gain and solidify trust with the youth, you will alienate the older group. Since your study will be concerned with a descriptive picture of the whole community, you likely cannot afford to do this.

Response to "4"

GOOD SELECTION. There are risks here. But you need to make this choice to avoid alienating the youth in the research area and to retain autonomy in conducting the research.

Moore and Anderson's productive principle is probably the most difficult to incorporate into an educational environment and the most difficult of the four to illustrate. Basically the principle is oriented to teaching students how to draw implications or make deductions from having been presented information that allows some inferences to be drawn. The information needs to be presented in such a way that it is partial but it conveys its rules of constitution so that the student can "go on" (in Wittgenstein's sense) or draw the implication embedded.

The decision point where particular effort has been made at being "productive" is in the step concerned with the selection of the research problem. The judgment has been that problem selection is very difficult because it entails determining what is not provided in the literature. It requires the researcher to follow a pattern of crescive development in research (available through a review of the literature) and to take the logical next step. The task is not to do the same thing as has been done; nor is it to do something radically different, that is, out of phase of the logical (or at least orderly) progression of the research. Sometimes the problem implied will be a replication, sometimes a study using a different sample, sometimes a study using a different method, sometimes a study allowing a test of two competing theories. In the exchange that follows, from SEXRLE, information is presented the student in encapsulated form drawn from an extensive literature review. The information is structured to allow the student to draw an implication about a logical next step for some research.

Material Presented to Student

BACKGROUND

A university faculty group has just formed a union and is building a staff to administer it, handle public relations, and handle arbitrations. In all cases, the staffing is being done very carefully. One of the most difficult jobs to fill is an arbitration post. What is needed is one who can deal effectively with public sentiment about teachers unionizing, the university administration, and the faculty. The person has to have excellent skills in person perception and the facility to assume a variety of roles.

An initial decision that will be made in terms of relevant characteristics for the person is whether to hire a man or a woman. The hiring group decides to look at some sex role research to determine whether women or men would be, in general, more suited for the job. What they find is a set of two conclusions. Each is bolstered by a well-developed theory. However, one theory and the aligned research tradition suggest women would be the best for the job. Another theory and body of research suggest men would fit the job specifications better. Faced with these contrasting conclusions, the committee has called you in to decide on some research that would resolve the contradiction and provide confirming evidence on the value of hiring either a man or a woman.

When you examine the theory and research, this is what you find.

A. Theory A suggests that skill in a range of situations and empathy in a range of role relationships depends on the number of "role preparations" the person had as a child. In other words, if a person had a varied and wide-ranging series of roles as a child the person would be a better bet for the job. In our culture where males are generally pushed toward independence and mastery of new situations more than females, this would in general suggest that males would be more likely to have the skills required.

B. Theory B, in contrast to Theory A, suggests that people in interaction operate to maintain parity or advantage and use those skills that they have to do this. People who are culturally or bureaucratically defined as powerful use this definition to advantage in dealing with others. However, people who are culturally or bureaucratically defined as subordinate in some social setting develop alternative skills for influence and control in the interaction. Some of these are greater facility in person perception and greater role taking and empathic ability. Because our society often culturally defines women and sometimes bureaucratically defines women in a subordinate status, this theory implies women are more apt to have these skills (i.e., person perception and role taking ability) than men. In that these are skills related to the job requirements, a woman should be hired.

I. PROBLEM

1. A study of contemporary American cultural stereotypes of men and women.
2. A study of collective bargaining power of males and females.
3. A test of the hypothesis about empathy and person perception from relative subordinate status.
4. A test of alternative hypotheses drawn from the two explanations.

Range of Response to the Student, Contingent on Selecting Any of the Four Possible Alternatives (Here, "4" is considered the most appropriate.)

Response to "1"

This would be a fairly useful study to engage in, in general. In this instance, though, there are two drawbacks. First, it is not specifically suggested by the background information. Secondly, even though there are gaps, there is a fair amount of information already existing about these stereotypes.

Response to "2"

If you found that men or women were more or less effective here you might make the inference that this skill reflects the broader ability of perception and empathy this job specification designates. However, this inference is considerably weaker than would be desirable for making judgments about the relative worth of the two theories.

Response to "3"

This is a justified alternative in that if you support this hypothesis you have evidence that a decision for a woman is theoretically grounded. However, in suggesting this you still have the viability of the rival theory remaining. Too, if you don't support the one hypothesis (from Theory B) you are left with no supporting evidence either way for a decision.

Response to "4"

NICE GOING. Though a little bit tricky to do, this is the most sure strategy to follow in order to answer the personnel question. This gives maximum likelihood of gaining needed support or needed disconfirmation of the alternative theories.

In retrospect, having used Moore and Anderson's theory and attempted to incorporate their principles, I would like to emphasize from our experience the support we find for their advocation that a sociological theory should underlie the design of educational environments. (Cf. Moore's comments on this in Aldous et al., 1971.) There are two reasons we have found for this. First, with a theory experience becomes transportable. Regardless of hardware, personnel, or educational substance, with a theory experiences in one setting can be translated into another setting. One of the most striking things evident in computer applications in education is the absence of such

theoretical underpinning. In my judgment this has constrained the reciprocal exchange of innovations among varied educational settings. A common observation in reports of computer applications is that successive settings find using other applications difficult (e.g., Wildgren, 1971). Such use can be expedited by some theoretical underpinning of any educational innovation. Secondly, with a theory educational computing experience can be translated into the general store of information in sociology. This is a positive feature in itself (as, again, Moore and Anderson have shown with their important basic research being produced coincident with their programmatic efforts). Also it provides a mechanism for blending teaching and research in university settings -- a blend that is neither easy to effect nor stable.

II. Educational Computing as a Site for Basic Research

Some of the motivation for starting work on these simulations was my belief that technology was good and should be incorporated into the service of undergraduate education. Even though it was unclear at the outset what possible results there might be for education or for sociology, simply the interest in education and the interest in technology was a sufficient motivation. Now at the outset I knew that educational computing was an ambiguous locus of activity within a university department of sociology where by institutional self-definition there is a mixture of teaching and research responsibility. This ambiguous character to educational computing was much more complex than the hackneyed "publish or perish" dichotomy or even the occasionally discussed differential evaluation of "basic research" and "applied research" in sociology.

More exactly, the problem is simply that the effort parameters and the potential yield (research or pedagogic) are very unclear. A computer application for instance can take a couple of hours to develop (as, say, a programmed learning experience) or take a matter of years to develop as with an elaborate simulation. However, the visible manifestation of either may be a poor basis for determining the relative investments of time. Given this ambiguity, there are two prototypical solutions. One is not to do educational computing because it is risky within university reward structures. Or one can do it irrespective of this risk, purely because of general interests in education and technology. I began with the latter set of motivations, but, strikingly, have been finding that the context of educational computing is a very rich source of basic research ideas. It can be a fertile source of information about social behavior. The implication of this finding is an additional confirmation that the teaching-research dichotomy is often a false one and that educational computing (or likely any concerted educational innovation) can provide strong inducement to those who have waivered before entering the arena because of their more archly non-applied theoretical and research interests. I will mention just two of the many research suggestions that have emerged in order to illustrate. These are in addition to the more obvious possibilities we have explored such as sex differences in response to technology, differential applicability of simulations to strong students and weak students, and differential applicability of simulations to class cohorts.

A. First, our experience has turned up a number of interesting aspects of the anthropomorphist activity of human actors. From the use

of pronouns, computers are as often thought to be male as neuter but rarely female. Computers can become significant refererce points for student self-conceptions. Often the reluctance of students to use technology has been that something might break or that the technology requires mechanical skill. Our experience is that as often as these constraints of usage are beliefs that "computers will think I am a dummy if I make a mistake." Computers are held accountable for credibility and distributive justice. In our research simulations, we have tried to provide positive feedback when the student selects a correct option in the decision making. However, frequently students have been critical of the computer as "two-faced" or "unjust" because in use the student might select three wrong answers before obtaining the right answer. However, when he got to the right answer he found in the computer response that a "well done" was provided, but this was hardly appropriate given the sequence of selections.

B. Secondly, the expressed intent of the research simulations was to provide training in the methodological subject matter, increase positive attitudes toward the course, and allow training in an area we felt was missed in customary methods courses: namely, the decision making connected with social research. We hoped the simulations would provide sufficient interest to reach some of these goals. Our expectations have been born out in part. Students performed about the same from being exposed to the simulations in terms of traditional course content, but they showed improvements in decision making and judgment capacity, and there were evidences of increments in positive attitudes toward the subject matter. However, we have found a rather curious feature that in addition to doing the simulations with success in mind, students frequently, after progressing through and doing their best to complete the simulations

effectively, went through again so that they could have the feedback from selecting all of the wrong alternatives. Now in a variety of ways this is an intriguing behavioral outcome. For example, it relates to an important comment made by Schild (1966) about simulations. He suggests that in simulations the actual skill that is learned may be to deal with the demand characteristics of the simulation or game itself, rather than what the game is actually trying to teach. Our experience of students going back through the simulations, though, to find out the feedback is that there is considerably more motivational power in the games themselves than the satisfaction of making a "correct" choice; the motivational force operating is not simply demand characteristics of hasty or successful completion.

Actually this finding parallels a very important possibility about a potential test of two theories in this setting. As mentioned, the theory underlying this instance of educational computing is premised on an autotelic principle of education: namely, that the crucial motivational facet of the experience be intrinsic (that is, the simulations are worth doing irrespective of external reward). Opposed to this would be an educational model which relied for motivational purposes on external reward factors. The findings here demonstrate that this may be a productive research site for testing such competing sociological theories of education (Moore and Anderson vs. Hamblin et al., 1969, e.g.).[2]

III. Educational Computing, Simulations, and Reform

In his 1966 presidential address to the American Sociological Association, Wilbert Moore spoke of the reformist tradition in sociology and suggested the need for renewed thinking of a reformist nature within contemporary sociology (Moore, 1966). He did so while employing the caveat of not identifying reform with value imposition or social engineering but by arguing that in so far as sociology is focused on interrelationships among properties and change the elements of reform are somewhat inherent to sociological concerns. In this last section, I want to discuss the work on research simulations within the context of Moore's statement. The intent here, as it has been throughout, is to add to a more broadly based linkage of educational simulations and computing with the past and present state of sociology in general. With only a minimum of license, it is possible to extract two themes or implications of the reform tradition Moore wants to reconstitute which can interface with efforts being undertaken in the field of educational computing. These themes I will call imaginative thought and self-reflection. The use of computers in education is an introduction of a new component in education, hence innovative and reformist. This coalescence is not necessarily good -- as computers or reform are not inherently positive. However, in the interest of articulating a broad conception of educational computing, this linkage of computing and reform is important to make explicit. Certainly it is a linkage which is a frequently articulated facet of the self-conception of people engaged in computer applications (note, in this regard, Kemeny, 1972 and Duke, 1974).

A. First, inherent in the reformist thinking of Moore is the idea of sociologists' imaginatively constructing social situations and their implications. This is literally what simulations entail and as such simulating is located within Moore's intention. Barton (1970) makes this connection clear in categorizing simulations into four types (all conceptual, man-model, man-computer, and all computer based); he places the conceptual thought at one end of a single continuum bounded at the other pole by fully computerized simulations.

Boocock and Schild indicated some eight years ago (1968) that if there is one greatest benefit from simulations it is when students write them themselves. So far as I know this has not systematically been implemented and described. Following the lead of the suggestion, we have done this with students taking our methods course. Willingness to undertake this activity has been evident,and the sentiment of those who have done this is positive. We have learned that this systematic channel for students to add to the system of research simulations is an important one for a couple of reasons. For example, Moore and Anderson have spoken of the perspective of the referee as a role important for the learner. This is related to Mead's "generalized other:" that is, the ability to take into account the set of elements and relations in a system. Relatedly, there are very few avenues of applied activity for students in sociology despite the fact that this is frequently a factor for selecting sociology as a major. We have operated with the assumption that there is no better domain for students to exercise the referee perspective or find applications for theoretical information than one's own educational environment. (Similar sentiments to these are expressed in Ofshe, 1970 and Postman, 1975.)[3]

B. Secondly, in Moore's terms reforms entail self-reflection. That is, they imply evaluation. Perhaps a useful juxtaposition to make with Moore's work is Donald Campbell's notion that reforms should be experiments (1969). Campbell begins: "The United States and other modern nations should be ready for an experimental approach to social reform [read 'educational reform'], an approach in which we try out new programs designed to cure specific social problems, in which we learn whether or not these programs are effective, and in which we retain, imitate, modify, or discard them on the basis of apparent effectiveness on the multiple imperfect criteria available" (409). It seems to me that educational computing has importantly aligned itself in its efforts with reform but is not yet incorporating the implication in Moore and Campbell's statements for self-reflection.

I wanted to get an idea about the extent to which this self-reflection underlies educational computing in sociology so I read in sequence the 39 social science applications that have appeared in the proceedings of the conferences on computers for the undergraduate curricula from 1970 to 1975. I looked for three features: (1) whether evaluative statements were made in the report; (2) whether evaluation was impressionistic, systematic, or used some control procedure; and (3) whether results reported were positive, negative, or mixed. Thirty-four of the thirty-nine made evaluative statements. Of these, ten were positive (no negative remarks), 24 were mixed, and none were solely negative. In four of the reports, systematic evaluation was reported (i.e., were empirical, provided explicit procedures, characterized the entire distribution of evaluated entities). In one of these, there was something approximating a controlled experiment where a group exposed to a computer application was compared to a group exposed

to another teaching device (Cutler, 1973). In mentioning this, it is done empathically. There are enormous problems involved in such evaluations: two major ones being the problem of privacy (Meyers, 1971) and the problem of simultaneously instituting the evaluation and the innovation. I do so for two reasons. The first is that my own evaluation has produced mixed results, my own impressionistic evaluation that the simulations are valuable notwithstanding. The second is that in light of the social organizational facets of educational computing (involving the technology, but also university departments and administrations, regents, and legislatures) and the stakes involved, the mention of the tie with Campbell's message about research in the political sphere is not simply analogical but substantive.

The basic evaluative design used in the implementation and evaluation of these research simulations is randomly to assign one-half of the class to the simulations the first half of the semester and one-half to a control condition. The places are reversed the second half of the semester (Figure A below). This is not inequitable since all will experience the simulations and the facilities will comfortably support only one-half of the class at any one time. At mid-term we make an evaluation which has included several measures of attitudes, an evaluation of increments in the basic content of the course, and in one of two periods of evaluation a rather involved assessment of increments of research judgment capacity.[4] The design also allows an evaluation at the end of the course, but because at that point both groups have received the treatment, interpretation of those results have been somewhat complex and are not provided here. In the first of two evaluation instances, 1974, our results showed no significant increment in content knowledge, some evidence of increment in positive attitudes toward the subject matter of research methods,

and a fairly strong increment in decision making or judgment capacity (Wieting, 1975). In 1975 we repeated the assessment of attitudes and content, leaving out the assessment of judgment capacity (a procedure which has proved to be particularly time consuming). The results for both years are provided in Tables 1 and 2 below. Our results from 1975 approximate those from 1974, but the evidence for attitude increment is even more tentative than in the 1974 results.

Referring now to the possible political facets of self-reflection, I was alerted to this issue by the title and sub-title of an article in a recent issue of the Chronicle of Higher Education (Magarrell, 1976): "Computerized Education: Time to Sink or Swim (So Says the N.S.F., Which Has Invested over $14-million in Two Teaching Systems)." The article is speaking of N.S.F. investment in PLATO and TICCIT and implied positive evaluation should be forthcoming to warrant the expenditure. I take from this not that educational computing should begin to operate as if it was backed up against the wall. But the realities, it seems to me, are that such a point of view as represented in this particular report makes of educational computing very much a political situation, hence the tie with what Campbell is saying. The options that Campbell describes may in fact be emerging for those involved in educational computing. On one hand the option may be forced for persons in educational computing as with political reformers to promise positive effects before the fact. The other option, which is what Campbell advocates for reforms, is to avoid the ultimately self-defeating nature of the first by emphasizing commitment to problems rather than specific solutions, to educate the public to the necessity of coupling hard-nosed evaluation with reformist activity, and to undertake in the process of reformist activity very careful evaluative steps.

TABLE 1.

1974 Evaluation

	VARIABLE	GROUP	N*	$\bar{x}$	"t" value	SIG. LEVEL (one-tailed)
I.	CONTENT KNOWLEDGE	Group A Group B	20 19	11.60 11.10	.47	N.S.
II.	ATTITUDE (LIKERT)	Group A Group B	21 25	3.76 3.65	.59	N.S.
III.	ATTITUDE (EVALUATIVE)	Group A Group B	21 25	5.57 5.12	1.72	$p < .05$
IV.	ATTITUDE (POTENCY)	Group A Group B	21 25	5.00 4.43	2.49	$p < .01$
V.	ATTITUDE (UNDERSTANDING)	Group A Group B	21 25	4.71 4.16	1.59	$p < .10$
VI.	JUDGMENT SKILL	Group A Group B	21 25	25.00 18.64	2.45	$p < .01$

*Different N's reflect different levels of participation at some stage of the implementation/evaluation (e.g., absence, not completing simulations).

TABLE 2.

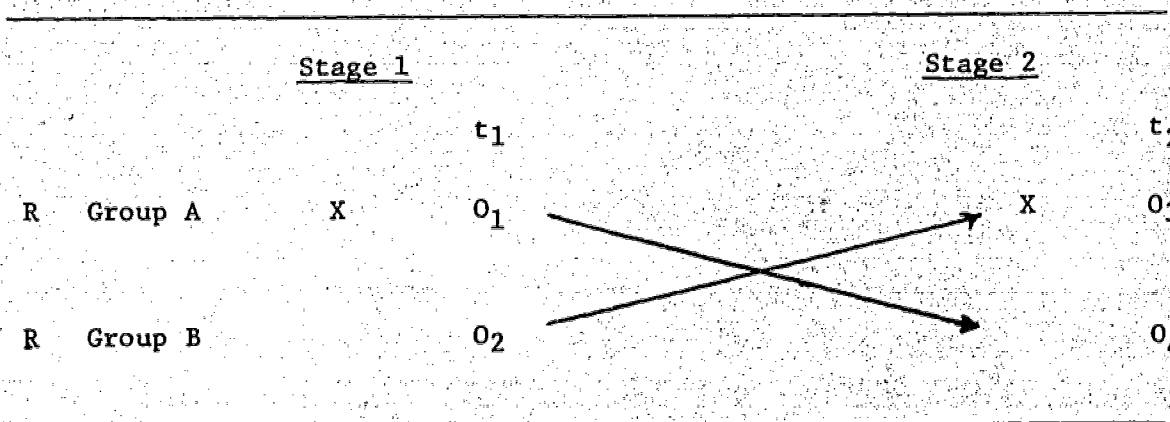
1975 Evaluation

	VARIABLE	GROUP	N*	$\bar{x}$	"t" value	SIG. LEVEL (one-tailed)
I.	CONTENT KNOWLEDGE	Group A Group B	21 24	28.43 28.17	.17	N.S.
II.	ATTITUDE (LIKERT)	Group A Group B	20 24	3.78 3.50	1.87	$p < .05$
III.	ATTITUDE (EVALUATIVE)	Group A Group B	20 24	5.43 5.32	.44	N.S.
IV.	ATTITUDE (POTENCY)	Group A Group B	20 24	4.88 4.87	.03	N.S.
V.	ATTITUDE (UNDERSTANDING)	Group A Group B	20 24	4.82 4.32	1.56	$p < .10$

*Different N's reflect different levels of participation at some stage of the implementation/evaluation (e.g., absence, not completing simulations).

Figure A.

Diagrammatic Summary of Design



Group A = Group which used simulations first half of semester; became control in second half of semester.

Group B = Group which was control in first half of semester; used simulations in second half of semester.

Figure B.

THE FOLLOWING QUESTIONS ASK ABOUT YOUR ATTITUDES TOWARD THE SUBJECT MATTER OF RESEARCH METHODOLOGY. IN EACH CASE PLEASE SELECT THE ALTERNATIVE THAT BEST REPRESENTS YOUR OWN ATTITUDE TOWARD THE SUBJECT MATTER OF RESEARCH METHODOLOGY.

YOUR ANSWERS WILL HAVE NO BEARING ON HOW YOU ARE EVALUATED IN THE COURSE. INCLUDE ONLY YOUR STUDENT NUMBER AND NOT YOUR NAME. NO ANALYSIS OF THE RESULTS WILL BE MADE UNTIL GRADING IN THE COURSE HAS BEEN COMPLETED.

PLEASE NOTE THAT THE QUESTIONS ARE ORIENTED TO THE SUBJECT MATTER OF RESEARCH METHODOLOGY. THUS, TRY TO RESPOND IN TERMS OF THIS FOCUS RATHER THAN OTHER MATTERS SUCH AS YOUR ATTITUDE TOWARD SOCIOLOGY GENERALLY, PERSONS INSTRUCTING IN THE COURSE, THE U of IOWA SOCIOLOGY DEPARTMENT, THE UNIVERSITY OF IOWA, AND SO ON.

1. Research methodology is useful for the understanding of sociology articles and books.

( )	( )	( )	( )	( )
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

2. Contact with the subj-ct matter of research methodology is useful for better performance in other sociology courses.

( )	( )	( )	( )	( )
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

3. I am better able to evaluate the arguments of sociology instructors from having studied research methodology.

( )	( )	( )	( )	( )
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

4. The subject matter of research methodlogy is not useful for my future employment.

( )	( )	( )	( )	( )
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

5. The information provided by research methodology is useful for dealing with practical problems in society.

( )	( )	( )	( )	( )
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

6. In general I am not interested in the subject matter of research methodology.

( )	( )	( )	( )	( )
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Figure C.

THIS CONCERNS THE WAYS INDIVIDUALS THINK ABOUT WORDS, THINGS, OR IDEAS. BELOW YOU WILL FIND A THING (IN THIS CASE "RESEARCH METHODOLOGY"), MARKED IN A BOX.

THIS IS FOLLOWED BY SEVERAL ADJECTIVE PAIRS WHICH HAVE OPPOSITE MEANINGS (such as "good" as opposed to "bad").

FOR EACH OF THE MARKED OFF WORDS, PLACE A CHECK MARK (✓) AT A POINT BETWEEN EACH OF THE ADJECTIVE PAIRS WHICH FOLLOW IT. THAT IS, PLACE THE CHECK SOMEWHERE BETWEEN EACH PAIR OF ADJECTIVES WHICH WILL SHOW HOW CLOSE IN MEANING YOU FEEL THE MARKED OFF THING IS TO EACH OF THE ADJECTIVES IN THE SEVERAL PAIRS. FOLLOW THIS PROCEDURE FOR EACH PAIR OF ADJECTIVES.

FOR EXAMPLE, IF YOU FELT A WORD SUCH AS SCHOOL HAD A MEANING MIDWAY BETWEEN THE ADJECTIVES "good" and "bad" YOU WOULD ANSWER FOR THAT ADJECTIVE PAIR IN THE FOLLOWING WAY.

| SCHOOL |

Good ___:___:___:✓:___:___:___ Bad

| RESEARCH METHODOLOGY |

Good ___:___:___:___:___:___:___ Bad

Powerful ___:___:___:___:___:___:___ Powerless

Familiar ___:___:___:___:___:___:___ Strange

Significant ___:___:___:___:___:___:___ Insignificant

Strong ___:___:___:___:___:___:___ Weak

Meaningful ___:___:___:___:___:___:___ Meaningless

Important ___:___:___:___:___:___:___ Unimportant

Vigorous ___:___:___:___:___:___:___ Feeble

Understandable ___:___:___:___:___:___:___ Mysterious

* M. Kenneth Brody, Dan Schouten, and Joel Kallich assisted in the preparation of this paper, and I am pleased here to acknowledge their contributions.

[1]As a stylistic option, a striking literary representation of three of these principles exists in John Barth's portrayal of Henry Burlingame's teaching techniques in The Sot-weed Factor (1973:7,8). "He found both to be rapid learners, especially apt in natural philosophy, literature, composition, and music; less so in languages, mathematics, and history. He even taught them how to dance, though Ebenezer by age twelve was already too ungainly to do it well. First he would teach Ebenezer to play the melody on the harpsichord; then he would drill Anna in the steps, to Ebenezer's accompaniment, until she mastered them; next he would take Ebenezer's place at the instrument so that Anna could teach her brother the steps; and finally, when the dance was learned, Ebenezer would help Anna master the tune on the harpsichord. Aside from its obvious efficiency, this system was in keeping with the second of Master Burlingame's three principles of pedagogy; to wit, that one learns a thing best by teaching it. The first was that of the three usual motives for learning things -- necessity, ambition, and curiosity -- simple curiosity was the worthiest of development, it being the 'purest' (in that the value of what it drives us to learn is terminal rather than instrumental, the most conducive to exhaustive and continuing rather than cursory or limited study, and the likeliest to render pleasant the labor of learning. The third principle, closely related to the others, was that this sport of teaching and learning should never become associated with certain hours or particular places, lest student and teacher alike (and in Burlingame's system they were much alike) fall into the vulgar habit of turning off their alertness, except at those time and in those places, and thus make by implication a pernicious distinction between learning and other sorts of natural behavior."

[2]Additional ideas for research on the sociology of computing and computers within educational contexts are found in Anderson and McTavish (1970). An important issue on which information is starting to be collected concerns the diffusion of ideas about computers and computing contexts into the general culture. Illustrative of this kind of interface is a statement by Anderson and Wieting (1973). A striking illustration of the diffusion of information about computers of particular relevance to our use of Moore and Anderson's "responsive environments" notions was the observation of a literary allusion to them in William Gaddis' recent novel, JR (1975:224).

[3]It is important also to note the complementarity between simulation activity (i.e., imaginative constructions of social systems and their implications) and theories of human development . The work of Piaget (1971, e.g.)and the interface of simulating and formal operational thought is particularly intriguing.

[4]To measure the basic content of sociological methods, a random sample of 25 items (40 in 1975) was drawn from the pool of final test items compiled over the previous years that the course was offered. These were multiple choice items and covered standard methods text and lecture material. To measure attitudes toward the subject matter, a 6-item scale with Likert response format was used. Also, a semantic differential format was provided to assess attitudes toward methodology. The phrase "research methodology" was used as the stimulus. A group of 9 adjective pairs was used with a 7-point scale for each. Three pairs came from an evaluative pool; 3 came from a potency pool; 3 came from an understandability pool.

To measure some practical or judgment capacity for conducting research, a paper-and-pencil instrument was developed. This essentially asked whether students could think of implications of a theoretical nature, of a practical nature, and of a research design nature when confronted with a hypothetical substantive topic.

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